

WHAT IS CLAIMED IS:

1. A method of performing adaptive intra refresh, the method comprising:
 - receiving a packet loss probability value;
 - receiving a motion vector for a first macroblock in a first frame;
 - mapping the motion vector onto portions of a plurality of other macroblocks in a previous frame;
 - calculating at least a first transition factor value based at least in part on the mapping;
 - calculating an estimated inter distortion value for the first macroblock based on at least the packet loss probability value and the first transition factor value;
 - calculating an estimated intra distortion value for the first macroblock based on at least the packet loss probability value;
 - receiving a first bit quantity value corresponding to a bit quantity used to intracode the first macroblock;
 - receiving a second bit quantity value corresponding to a bit quantity used to intercode the first macroblock; and
 - based at least in part on the estimated inter distortion value, the estimated intra distortion value, the first bit quantity value, and the second bit quantity value, transmitting the first macroblock as one of an intra macroblock and an inter macroblock.
2. The method as defined in Claim 1, further comprising transmitting the first macroblock as one of an intra macroblock and an inter macroblock based in part on a quantization distortion value.
3. The method as defined in Claim 1, further comprising determining a first difference value based on a difference between the estimated intra distortion value and the estimated inter distortion value, and a second difference value based on a difference between the first bit quantity value and the second bit quantity value.
4. The method as defined in Claim 2, wherein the first macroblock is transmitted as an intra macroblock at least partly in response to the second difference value being positive,

and the first difference value divided by the second difference value being more negative than a first threshold.

5. The method as defined in Claim 2, wherein the first macroblock is transmitted as an intra macroblock at least partly in response to the second difference value being zero, and the first difference value being negative.

6. The method as defined in Claim 2, wherein the first macroblock is transmitted as an intra macroblock at least partly in response to the second difference value being negative, and the first difference value divided by the second difference value being greater than a first threshold.

7. The method as defined in Claim 6, wherein the first threshold is a weighting factor.

8. The method as defined in Claim 2, wherein the first macroblock is transmitted as an inter macroblock at least partly in response to the second difference value being zero, and the first difference value being positive.

9. The method as defined in Claim 2, wherein the first macroblock is transmitted as an intra macroblock at least partly in response to the second difference value being negative, and the first difference value divided by the second difference value being less than a first threshold.

10. The method as defined in Claim 2, wherein the first macroblock is transmitted as an intra macroblock at least partly in response to the second difference value being positive, and the first difference value divided by the second difference value being less than a first threshold.

11. The method as defined in Claim 1, wherein the estimated intra distortion value is further based on an initial error energy.

12. The method as defined in Claim 1, wherein the estimated intra distortion value is further based on an initial error energy squared multiplied by the packet loss probability value.

13. The method as defined in Claim 1, wherein the estimated inter distortion value is recursively calculated to include distortion propagated from a plurality of previous frames.

14. The method as defined in Claim 1, wherein the first transition factor corresponds to a first half-pixel horizontal and vertical propagation strength.

15. The method as defined in Claim 1, wherein the first transition factor corresponds to a first half-pixel horizontal strength.

16. The method as defined in Claim 1, wherein the first transition factor corresponds to a first half-pixel vertical propagation strength.

17. The method as defined in Claim 1, further comprising limiting how many macroblocks can be intracoded in the first frame to a first amount.

18. A method of selectively intracoding macroblocks, the method comprising:

receiving a packet loss probability value;

receiving a motion vector for a first macroblock in a first frame;

based at least in part on the motion vector, determining which portions of macroblocks in a previous frame would be used in predicting the first macroblock;

calculating at least a first propagation strength value based at least in part on determining which portions of macroblocks in the previous frame would be used in predicting the first macroblock;

calculating an estimated inter distortion value for the first macroblock based on at least the packet loss probability value and the first propagation strength value;

calculating an estimated intra distortion value for the first macroblock based on at least the packet loss probability value;

calculating a quantization distortion value for the first macroblock;

receiving a first bit quantity value corresponding to a bit quantity used to intracode the first macroblock;

receiving a second bit quantity value corresponding to a bit quantity used to intercode the first macroblock; and

based at least in part on the estimated inter distortion value, the estimated intra distortion value, the quantization distortion value, the first bit quantity value, and the second bit quantity value, providing for transmission the first macroblock as one of an intra macroblock and an inter macroblock.

19. The method as defined in Claim 18, wherein the intra distortion value is further based on an initial error energy.

20. The method as defined in Claim 18, wherein the estimated inter distortion value is recursively calculated to include distortion propagated from a plurality of previous frames.

21. The method as defined in Claim 18, wherein the intra distortion value is further based on an initial error energy squared multiplied by the packet loss probability value.

22. The method as defined in Claim 18, wherein the first macroblock is provided as one of an intra macroblock and an inter macroblock further based upon a weighting factor.

23. The method as defined in Claim 22, wherein the weighting factor is generated at least in part by calculating a plurality of intra distortions values using corresponding different quantization parameters, and selecting a weighting factor value that results in the lowest distortion value meeting a first bitrate criterion.

24. A method of selectively intracoding macroblocks in a plurality of macroblocks in a first frame, the method comprising:

- receiving a packet loss probability value;

- receiving a corresponding motion vector for each macroblock in the plurality of macroblocks;

- based at least in part on the corresponding motion vector, determining which portions of macroblocks in a previous frame would be used in predicting said each macroblock;

- calculating for each of said macroblocks at least a first corresponding propagation strength value based at least in part on determining which portions of macroblocks in the previous frame would be used in predicting said each macroblock;

- calculating for each of said macroblocks an estimated inter distortion value based upon at least the packet loss probability value and the corresponding at least first propagation strength value;

- calculating for each of said macroblocks an estimated intra distortion value based upon at least the packet loss probability value;

- calculating for each of said macroblocks a quantization distortion value; and

based at least in part on the estimated inter distortion, the estimated intra distortion, and the quantization distortion values for each macroblock in the plurality of macroblocks, designating a subset of the plurality of macroblocks to be intracoded.

25. The method as defined in Claim 24, wherein the subset is limited to a predetermined number of macroblocks.

26. The method as defined in Claim 24, further comprising:

for each of said macroblocks, receiving a first bit quantity value corresponding to a bit quantity used to intracode said each macroblock; and

for each of said macroblocks, receiving a second bit quantity value corresponding to a bit quantity used to intercode said each macroblock, wherein the subset is designated based in part on the first bit quantity values and the second bit quantity values.

27. A circuit configured to selectively intracode macroblocks, the circuit comprising:

a first instruction configured to receive a packet loss probability value;

a second instruction configured to receive a motion vector for a first macroblock in a first frame;

a third instruction configured to determine, based at least in part on the motion vector, which portions of macroblocks in a previous frame would be used in predicting the first macroblock ;

a fourth instruction configured to calculate at least a first propagation strength value based at least in part on the determination of which portions of macroblocks in the previous frame would be used in predicting the first macroblock;

a fifth instruction configured to calculate an estimated inter distortion value for the first macroblock based on at least the packet loss probability value and the first propagation strength value;

a sixth instruction configured to calculate an estimated intra distortion value for the first macroblock based on at least the packet loss probability value; and

a seventh instruction configured to selectively provide for transmission the first macroblock as one of an intra macroblock and an inter macroblock based at least in part on the estimated inter distortion value and the estimated intra distortion value.

28. The circuit as defined in Claim 27, wherein the intra distortion value is further based upon an initial error energy.

29. The circuit as defined in Claim 27, further comprising an eighth instruction configured to calculate a quantization distortion value for the first macroblock, wherein the seventh instruction is further configured to selectively provide for transmission the first macroblock as one of an intra macroblock and an inter macroblock based at least in part on the quantization distortion value.

30. The circuit as defined in Claim 27, wherein the fifth instruction is further configured to recursively calculate the estimated inter distortion value to thereby include distortion propagated from a plurality of previous frames.

31. The circuit as defined in Claim 27, wherein the intra distortion value is further based on an initial error energy squared multiplied by the packet loss probability value.

32. The circuit as defined in Claim 27, wherein the seventh instruction is further configured to selectively provide for transmission the first macroblock as one of an intra macroblock and an inter macroblock based at least in part on a weighting factor.